

Neurological Digest.

CURRENT ANATOMY, PHYSIOLOGY AND PATHOLOGICAL
ANATOMY OF THE NERVOUS SYSTEM.

BY JOSEPH COLLINS, M. D.

ON THE PATHOLOGICAL ANATOMY OF CHOREA MINOR.

Dr. Wallenberg (*Archiv f. Psych. u. Nervenkrank.*, vol. xxiii.). The author gives at first a brief review of the anatomical investigations that had been made in chorea from the time when Broadbent first published his views, regarding it as a disturbance of nutrition in the corpus striatum and optic thalamus manifested or resulting from capillary emboli, and so propagating the "embolic theory of chorea." Quoting from Elischer's paper (*Virchow's Archives*, vol. lxiii.), he says the corpus striatum showed irregular bodies sharply outlined, with strong refractive property, which clung to the interior of the blood-vessels in mulberry-like groups, laid one above the other, and regarded by him as composed of amyloid material. Elischer laid but little stress on these bodies, and his observations seemed to pass unobserved till Flechsig in 1888 confirmed these results and reported four cases, localizing the pathological change in the globus pallidus. Later Jokowenko, a pupil of Flechsig, published the results of the examination of six brains from persons who had died of acute delirium with chorea. In all cases he found in the lenticular nucleus, especially in the second divisions; that is, the outer part of the globus pallidus, bodies corresponding to those reported by Flechsig. These bodies gave the reaction of hyaline as described by Recklinghausen.

With the idea of settling the question as regards the pathological changes in chorea minor, Wallenberg divided his anatomical work into two parts: First, the examination of the brains of six patients who had died with chorea; and second, forty-six brains from patients who had never presented choreic symptoms during life.

The results were as follows:

(1) In some cases of chorea—and it was the same in simple chorea as in the so-called chorea with delirium—I

find in a definitely limited district of the lenticular nucleus (the globus pallidus, not the putamen) numerous strongly refractile substances of roundish form which were very resistant to coloring matters and reagents, and which were for the most part laid along the sides of the blood-vessels in a peculiar way.

(2) These substances are in no way characteristic of chorea; for they are found exactly similar in the brains of individuals who had never suffered from chorea.

(3) These substances must be considered in all probability to be the calcification of an organic ground-substance, concerning the nature of which no positive opinion can be given.

These bodies do not give a reaction with alcohol, ether, Lugol's solution, osmic acid, nor liquor potassa; but in one case the action of acetic acid seemed to give a clearer idea that they were made up of concentric layers. By treating with sulphuric acid, the substances seemed to clear in small needle-shaped bodies, and then be dissolved. The action of hydrochloric acid was somewhat uncertain. In three cases it dissolved the substances altogether; and three other cases only the larger bodies. From a consideration of these experiments Wallenberg reaches the conclusion that they are of the nature of an organic ground-substance of a peculiar lime formation that is not completely dissolved by these reagents, comparable, for instance, to the contents of the pineal gland. This substance was not stained in the least by the presence of carmine or Weigert's fibrin stain. With hæmatoxylin ferrocyanide it was colored darkish gray verging on black; colored with acid fuchsin-aniline water, and decolorized with picric acid this substance was of a dull red color. Therefore the author thinks it is not justifiable to consider them of a hyaline or fibrinous nature.

The article is illustrated by two very excellently executed plates, which assist materially in the comprehension of the anatomical changes described by the author. A rather complete list of the literature of chorea since 1874 is appended to the paper, a perusal of which and the article it is to be hoped will stimulate other investigators to determine the essential histological changes in this very complex disease.

These experiments of Wallenberg's give evidence of being scrupulously performed and reported, and will, no doubt go a long way in corroborating the opinion that is probably held by the majority of pathologists that these changes described by Elischer, Flechsig, and others are by no means characteristic and are generally to be considered

as concomitants of chorea. Almost every conceivable small lesion has been reported by trustworthy writers; from areas of hemorrhage and softening in the cerebrum as by Tucknell, to probable marked primary changes of nutritive in the cortex by Dana, and calcification of Purkinje cells in the cerebellum by Golgi, and innumerable others locating the various lesions in the various parts of the central and peripheral nervous system. The greatest rational objection to belief in an extensive central pathological change in chorea is a consideration of the statistics as regards prognosis, the death-rate in this disease being not more than two or three per cent., and then again the duration of the disease is rarely more than two or three months, which if most of the pathological changes that are described were a constant factor this state of things would be inconceivable. If, as it was formerly thought, it could be proven that there was an arrangement or a rearrangement of motorial impulses originating in the cortex in the corpus striatum, then Elischer's views would command more attention; but this hypothesis has no foundation. Again reasoning from the complexity of motorial symptoms, those views which ascribe a primary nutritional change in the cortex, varying in intensity from the slightest which accompany the cases ending in recovery to the very severe ending fatally, would seem most probable. Necessarily these cortical changes do not forbid that there should be other changes in the cord and perhaps nerves; for like changes are a most common secondary condition in other affections of the cortex. Then fright is unquestionably the most potent factor in exciting chorea. Whether or not this is merely the element that sets in activity the machinery that is already prepared by changes that have gone on preceding it in the cortex, or whether the psychical trauma is in itself sufficient to set up those changes in a field that is already prepared for it by inherited neuropathic predisposition and other concomitant factors can only be a mere matter of theory. Some light can probably be thrown on this problem by experimental lesions in those animals possessed of brains that are well known and in the artificial production of chorea.

THE CLINICAL AND PATHOLOGICAL CHANGES OF MULTIPLE "ALCOHOL NEURITIS."

R. Thomsen (*Archiv f. Psychiatrie u. Nerven.*, xxi., 3, p. 806). The author relates three cases presenting symptoms of multiple neuritis apparently due to the ingestion of alcohol, in

which careful examination was made after death. The first case occurred in an alcoholic twenty-four years of age in which the symptoms of multiple neuritis ran a very rapid course, death occurring eight days after the patient entered the hospital. At the autopsy the examination of the cord and bulb gave no result other than normal, and integrity of the roots of the cranial nerves. Although during life the patient had presented abnormal rapidity of the heart's action, ptosis on the left and double paralysis of the motor oculi external and nystagmus. The lesions in general were those of an extensive polyneuritis with degeneration of the muscles; this last, however, of secondary importance.

In the second case there was made during the life of the patient a diagnosis of *tabes dorsalis*. For six years the patient had complained of constriction and the iron band sensation, with incontinence of urine, and he presented complete abolition of the patellar reflexes. As for the other symptoms, there were amblyopia, paralysis of the oculo-motor external, nystagmus, delirium and convulsive manifestations. At the autopsy the cord and roots of the cranial nerves were found in a state of perfect integrity.

In the third case the symptoms were those of an alcoholic polyneuritis with ptosis, nystagmus and tachycardia. This last symptom was probably caused by a hæmorrhagic focus which occupied the posterior root of the vagus nerve. The ptosis might also be explained by the presence of a small hæmorrhagic focus in the neighborhood of common oculo-motor nerve. On the contrary, the root of origin of the oculo-motor external and the territory around it was intact. It is true that the paralysis of the oculo-motor external had its reason of being in the alteration which had gone on in the central gray substance in the neighborhood of the aqueduct of Sylvius.

It would seem to be quite thoroughly proven that alcohol when taken for any considerable period has a special predilection for the peripheral nerves, but although many and able investigators are at work on this problem the conclusions that can be drawn from their labors are incomplete, for the reason that during life the clinical symptoms are not closely observed and recorded. For instance, in the second case reported above, where a diagnosis of locomotor ataxia was made, if the paræsthesia and motor symptoms had been accurately noticed, it would have been a valuable item in showing whether or not the motor nerves are most readily affected. In the experiments that have been recently performed by Spink in this direction, he describes a twisted

condition of the axis cylinders which the writer has seen in some experimental cases and which it is to be hoped will be corroborated or denied by other investigators.

THE CONFORMATION OF THE SKULL.

The conformation of the skull has always been a fruitful theme for discussion relative to the cerebral development and its functions. Some time since Bullen made an investigation of the skulls of 1,565 patients who had died at the Wakefield Asylum. He says that the irregularities of the cranium have been frequently noticed, but the main one has been that of lack of symmetry. Of the entire number of cases examined more than one hundred had some form of irregularity. The large skull—either square or circular—is met with oftenest in maniacs. The elongated occurs more frequently in cases of general paralysis and epilepsy; and those cases in which the vault resembled a dome were found, particularly in cases of mania and some cases of general paralysis. In cases of melancholia there seemed to be a special development of the frontal region, while in syphilis a lack of development in the frontal region was the most striking feature.

The anomalies in shape which would seem to indicate an inferior condition were found in totally different cases, as, for instance, in imbeciles and others where there was normal development of the faculties. Lack of symmetry was found in 20 per cent. of all the cases examined and was demonstrable by some anomaly in the conformation of the frontal, parietal or occipital regions manifested by a diminution of capacity of the sides of the skull or by a kind of torsion by which one side advanced forward more than the other. The first variety, that in which there existed a local malformation, was found in 40 per cent. of all cases in which lack of symmetry was found, and it occurred on the left side twice as often as on the right. The temporo-parietal and parieto-occipital region presented 30 per cent. of these malformations, the majority being as with the others on the left side, although the cases in which the projection of the right frontal region over the cranial anomaly was just double that of the left. The capacity of one-half of the skull cavity was increased in 50 per cent. of the cases, the majority being on the right side, and when the right side was more voluminous there was observed a superiority of the frontal region of the same side and coincident with a superiority of the temporo-parietal region of the left side. This lack of symmetry was

greatest amongst cases of chronic melancholia, next in epilepsy, and least amongst those of general paralysis. The capacity of each half of the skull did not always correspond with the size of its cerebral hemispheres, in fact a small cerebral hemisphere often occupied a comparatively bare half of the cranium. In a series of twenty-nine cases of dementia the right hemisphere was the larger, fourteen times out of twenty-three, while the diminution in the capacity of the right side of the skull occurred seventeen times to twelve of the left side. In twelve of these cases only did each half of the skull correspond in size to the cerebral hemisphere.

The author also examined the membranes, convolutions, blood-vessels, etc., and gives an interesting array of figures for the different mental affections and different ages.

ON THE ETIOLOGY OF PERIPHERAL FACIAL PARALYSIS.

Dr. S. Goldfan (*Neurolog. Centrallb.*, vol. xvi.). The author considers four cases of facial paralysis occurring in syphilitic subjects. The symptoms referable to the facial nerve coming on a very short time after the primary lesion; that is, before or during the stage of roseola. The symptoms presented themselves in the first case in thirty-five days; in the second, in three months; in the third, in fifteen days; and in the fourth, in twenty days. In one of the cases an ordinary attributable cause was present, namely, exposure to cold; but this was very slight. In the second the patient, an actor, had simulated toothache on the stage the evening previous, pressing against the side of his face with his handkerchief. In the remaining two cases no attributable cause could be assigned. Facial paralysis occurring during the third stage of syphilis is ordinarily not a difficult matter to explain, for it may be due to gummata, basal meningitis, periostitis, exostosis, caries of the petrous portion of the temporal bone or changes in the trunk of the nerve itself; but the author finds it difficult to explain how it occurs in cases where all these factors can be ruled out. Lang's hypothesis, that is, that during the appearance of the syphilitic exanthem there is a coincident infiltration into the basal meninges or the central nervous system itself, which is sufficient to account for the peripheral paralysis. This the author considers untenable. The only light he can throw on the problem is expressed by saying that under the influence of the syphilitic infection and in the very

early stages of the disease, particularly during the period of eruption, there exists a marked disposition on the part of the facial nerves to peripheral inflammation and paralysis.

KATATONIE.

W. Julius Mickle (*Brain*, Sept., 1890). The author concerns himself in this paper with a report of the necropsy of an individual whose case was reported in the same journal for September, 1889. The patient's history and symptoms at the time when the diagnosis of katatonie was made are briefly as follows: A young man, twenty-five years of age, single and of good habits, the son of a very nervous and easily agitated mother, had been convicted of robbery and was for some years in prison. Presents severe mental symptoms. Would stand in one place for hours silent and immobile, or would go through rhythmical movements when so standing, as, for instance, moving the head forward and backward or to the right and left regularly and methodically, flexing and extending the forearm. Again, he would start to go somewhere and retrace and trace his steps and do other things without purpose, as for instance persistent opening and closing of a door. He was not suicidal, epileptic or dangerous, but occasionally had periods when he was destructive. Was well nourished, muscular and viscera fairly normal, cranium widest posteriorly, narrow forehead and prominent frontal eminences. No external syphilitic manifestations. Would not obey when commanded, and had periods when he would be silent for several days; would not reply to questions; and then again his speech would be of a stereotyped and theatrical character, foolish and non-pertinent. Thought spirits talked with him, and he could see nude forms; knee-jerks fairly normal and muscles sometimes in a more or less cataleptic condition, and under passive motion limbs move with a kind of stiffness. The patient died of influenza of the congestive or pneumonic type. The marked symptoms preceding death being dyspnoea, respiratory and pericardiac oppression, bluishness of face and lividity. The principal noteworthy points in the necropsy record were as follows:

(1.) The deviation from the normal type, or atypical peculiarities, of cerebral fissures and gyri in relation to the patient's criminal and insane antecedents.

(2.) In relation to katatonie, the existence at the anterior part of the inferior and mesial surfaces of the cerebral hemispheres of patches which have been termed "adhesion and

decortication," namely, adhesion of pia to the brain and separation of the superficial layers of the gray matter where the membranes are stripped off.

(3.) Slight thickening and opacity of the pia-arachnoid over the base of the brain, and the great thickening, toughness and opacity over the supero-lateral and fronto-parietal region, with corresponding pial œdema, over easy removal of the meninges and wasting of the gyri.

(4.) The cortical microscopical appearances.

(5.) Brain generally firmish, congested probably by the final illness and mode of dying; some evidence of old hyper-æmia.

(6.) Thick, heavy calvaria of rounded triangular shape in transverse section, the rounded apex representing the forehead.

Katatonie is a name suggested by Kahlbaum, and from its origin signifies tension, and its applicability was based on the fact that, with a certain symptom complex such as the above, tension or a minor form of cataleptic condition of the muscles was a prominent symptom. Kahlbaum's conception of the disease designated as katatonie is a large one and might be considered as a form of mental derangement progressing from melancholia, through mania and stupidity, to imbecility and tonic convulsions. Other writers on the subject are not wont, however, to give such a comprehensive meaning to this condition, but merely classify it as a psychoneurosis or at most a hereditary neurosis and mental degeneration. The disease is as yet but little known and studied in this country, but the symptoms as given in the above case are fairly typical. The disease is not marked by a clearly delineated clinical picture. The peculiar rotating different mental states manifested facially, oratorically, psychically, or by different movements and gesticulations, and the cataleptoid condition of the muscles are, however, the main points in the diagnosis.

It is to be hoped that Dr. Mickle will give us later a minute description of the microscopical changes found in the central nervous system, so that we may get a step nearer to a clearer conception of the pathological conditions present, particularly as regards the nature of the changes that take place, whether they be nutritional, degenerative, inflammatory or wholly non-developmental.

THE ANATOMICAL CONDITION FOUND IN THE
BRAIN OF A PATIENT DYING OF CARBONIC-
OXIDE POISONING.

A rare condition is reported by Dr. C. Cramer, in the *Centralb. f. Allgm. Path. u. Pathol. Anat.*, vol. ii., 1891, of a woman seventy-one years of age who suffered from the results of carbonic oxide poisoning, the symptoms lasting for over a month. The poisoning resulted from premature closing of a stove damper, and the patient was found some hours later in an unconscious state, pulseless, and with extremely weak, feeble breathing. The unconsciousness lasted for three days. A week later the patient's mind became entirely deranged, and then she passed into a general apathetic condition, the pupils equal and reacting shortly, and a slight hyperæsthesia over the entire body. A fortnight afterwards the patient had an elevation of temperature with frequently repeated exacerbations. This continued for several days, the patient gradually sinking into a typhoid state and dying apparently from asthenia. On post-mortem examination the sinuses of the dura mater were found to be distended, and the pia mater over the convexities had lost its normal glistening appearance, and its blood-vessels were also very much distended. No marked loss or change in the substance of brain. The cortex and gray substance of the ganglia of the caudex cerebri were much redder than ordinarily, and the white substance peculiarly tough and resisting.

Microscopically, the tangential and supraradial layers of the cortex were clearly seen to be degenerated, resembling the condition found in senile dementia. Spread throughout the cortex were found numerous granular-like looking little bodies. The capillaries showed budding processes and the ganglionic cells were diseased. Spindle-shaped cells were sparsely scattered through the cortex, and the large vessels were for the most part normal.

Toward the centre of the cortex the spindle-shaped cells were largely proliferated, and in the basal ganglia pons and medulla a part of the blood-vessels were degenerated and in a small spot at the floor of the aqueduct of Sylvius a proliferation of neuroglia was found.

Before the onset of the symptoms the patient had given no evidence of beginning senile dementia or general paralysis, and on this ground the author is inclined to refer the changes to the carbonic-oxide poisoning; whether it was the primary or secondary cause it is impossible to say. The case illustrates further how very prone the medullary

fibers of the cortex are to degeneration from noxious or pernicious influences.

CIRCULATION—THE CONDITION OF THE CIRCULATION OF THE BLOOD IN THE BRAIN DURING AN ATTACK OF EPILEPSY.

Prof. W. S. Bechterew has recently reported some experiments on the condition of the circulation in the brain during attacks of epilepsy produced artificially in dogs, which are published in *Neurolog. Centralb.*, No. 22, 1891. The epileptic attacks were produced from irritation of the cortex cerebri by the electrical current or by the introduction into the circulation, through the femoral vein, of essence of absinthe, cinchonia or cinchonidin. Then, after trephining, the state of the vessels were observed these openings made over the motor areas or the occipital or laterally, in which was fitted a piece of glass so that they could be observed with the naked eye or by the use of a lens.

During the epileptic phenomena the smallest blood-vessels of the pia in the field of observation were seen to be distended, the brain substance became reddened and enlarged so that it pressed up against the glass. This distension of the brain substance passed away very gradually till the brain reached its normal condition, the blood-vessels that were most severely congested remaining the longest, and not disappearing till the animal was in a comatose condition.

These changes were more sharply marked when the epilepsy was induced by injecting irritants than when brought about by the electrical current.

The blood pressure determined in the circle of Willis and the carotid showed in the beginning of the tonic period there was ordinarily an elevation in the blood pressure in both ends of the arteries and a strange elevation at the cerebral part as determined by the manometer (the method of Hurtle was used in determining blood pressure). This blood pressure reached its gradual height about the end of the tonic period. At the appearance of the clonic stage the blood pressure began to fall gradually, more strongly at the ends of the artery than peripherally, and at the end of the attack the pressure reached normal. Coincident with the changes in the blood pressure in the carotid were marked changes in the strength and rapidity of the heart and respiration. At the beginning of the tonic state a more or less distinct slowness and increase of strength in the heart and

pulse beat was noticed. Ordinarily this condition soon gave way to a rapid and somewhat feeble pulse and heart beat. When the clonic period set in the heart again became slow and gradually got back to normal during the comatose period. The conclusions to be drawn from the respiratory changes are not so certain on account of the convulsions.

Asylum Notes.

MURRAY ROYAL ACADEMY, PERTH, SCOTLAND.

By MARGARET A. CLEAVES, M D.

In the sixty-fourth report of this asylum, Dr. Urquhart, the superintendent, very pertinently points out, that while 17 of the 48 admissions were accredited with good health in the statistical tables, they were, upon careful analysis, found variously to be the subjects of arrested development, vicious habits, previous attacks of insanity, acquired disease or accidents, acting powerfully upon the nervous system. Twenty-one were frankly catalogued as suffering from more or less pronounced physical disease, either causative of insanity or accompanying and aggravating the disorder. In every instance of insanity the nutrition, relations, or functions of the brain cells is interfered with by disease, accident, or such a powerful cause as alcoholism.

In all asylums reports it is customary to credit a certain percentage of admissions with good bodily health. In these cases the relation of the insanity to any known physical disease has been shrouded in the most absolute darkness.

The pathological investigations of Dr. Bevan Lewis, second to those of no living man save Meynert, have "brilliantly illumined the facts of clinical experience and have given fresh impetus to the treatment of mental maladies."

Concerning the causes of insanity, Dr. Urquhart reports "that it yearly becomes more manifest that some inherited constitutional tendency to the more obvious forms of mental disease, or a mere nervous instability, is a fundamental necessity in the evolution of these disorders. In one case only did a mental (moral) cause, without ascertainable physical cause, produce insanity. It would almost seem that the cares and troubles of mortal life are impotent to overthrow a well-balanced brain. A certain inherited vice